Balloon Embolectomy of a Cylindrical Dissected Plaque That Complicated Performing Superficial Femoral Artery Angioplasty

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ABSTRACT

We report here on a case of successfully removing a calcified plaque embolus that complicated performing angioplasty. A 67 year-old woman underwent percutaneous transluminal angioplasty for a stenosis of the right superficial femoral artery (SFA). The angiogram showed a marked stenosis at the mid-portion of SFA and diffuse circular calcification along the atheroma rim was seen on the computed tomographic angiography. Although balloon inflation was attempted on the lesion, it was not fully dilated. After repeated balloon inflations, a radiopaque calcified atheroma was detached from the arterial wall and it migrated proximally along with withdrawing the balloon. The embolus was too extensive to be pulled out through the catheter sheath; therefore, a small balloon was inflated at the distal end of the embolic atheroma to anchor it and the embolus was removed with the balloon and the sheath system via an arteriotomized puncture site. A huge cylindrical atheroma that measured 4 cm in length was successfully removed. The final angiography showed a widened target site without any dye leakage. (Korean Circ J 2008;38:335-338)

KEY WORDS: Femoral artery; Angioplasty; Complication; Calcification.

Introduction

Endovascular therapy is the treatment of choice for Trans-Atlantic Inter-Society Consensus (TASC) type A infrainguinal lesions.1 The complications after performing percutaneous transluminal angioplasty (PTA) at these lesions were reported to be less than 5%.2 We report here on a rare experience of a cylindrical embolus that occurred during performing PTA in the superficial femoral artery (SFA). The embolus was removed through an arteriomy site, and the patient displayed a good clinical outcome.

Case

A 67 year-old woman with diabetes and hypertension underwent PTA for Fontaine’s stage IIb claudication in the right leg. The ankle-brachial index (ABI) of her right leg was 0.7. Angiography showed a marked stenosed TASC type A lesion in the mid-portion of the superficial femoral artery (Fig. 1A), and diffuse circular calcification along the atheroma rim was seen on computed tomographic angiography (CTA) (Fig. 1B and C). Despite inflating a 4.0 × 40.0 mm Powerflex™ balloon (Cordis, Johnson and Johnson Co., Miami, USA) up to 20 atmospheres on the lesion, full dilation was not achieved, and on an inflation attempt with a larger balloon inflation, the radiopaque calcified atheroma was detached from the arterial wall and it migrated proximally (Fig. 1D and E). The proximal movement of the embolus was augmented with withdrawing the balloon (Fig. 1F). The embolus was too extensive to be pulled through the catheter sheath; therefore, a 1.5 × 20.0 mm Sprinter™ balloon (Medtronic Co., MN, USA) was inflated at the distal end of the atheroma to anchor it and the embolus was drained with the balloon. A huge cylindrical atheroma that measured 4 cm in length was successfully removed at the arterial puncture site, which was opened wider via surgical incision. The mass was bony hard with a whitish circle along the rim, and pathologic examination revealed a typical atherosclerotic plaque composed of lipid deposits and thickened fibrotic...
intimal tissue. In addition, it showed reduplication and fragmentation of the internal elastic lamina and thickening of the media with fibrotic degeneration (Fig. 2C, D and E). The final angiography showed a widened target site without dye leakage, and the post-procedure ankle brachial index (ABI) improved to 0.9. The patient has remained symptom free for six months after the procedure.

Discussion

PTA is an established procedure for most patients with focal stenotic lesions of the SFA due to its high technical success rate. Although the incidence of PTA complications is quite low in these lesions, PTA is traumatic to arterial tissue, causing plaque fissuring and/or dissection. These types of traumatization of arterial tissue are factors that contribute to acute procedural complications, which require either further catheter intervention or surgery.

In this case, dissection and embolization of the calcified atherosclerotic plaque occurred immediately after dilating the balloon on the SFA lesion. According to the previous literature, most embolisms or dissections following balloon dilatation were successfully treated during the course of the angioplasty by performing further procedures. In contrast to the prior reports, the extent of dissection was tremendous in our patient and the size of the bony hard embolus was also too huge to be taken out from the sheath percutaneously,
and so arteriotomy was required. Another therapeutic option was deploying a stent to exclude the embolus from the arterial lumen. However, the embolus was undilatable with prior balloon inflation and it was huge in size; therefore, a stent could not pass the embolus. Although the pathologic examination failed to verify calcium deposited on the atheroma, the observed radiopacity of the atheroma on fluoroscopy and the CTA findings strongly support the calcification of the atheroma. In this case, the calcium deposits on the atheroma lay in circumferential manner, which created a bony hard structure that was resistance to balloon dilation. As such, we think that the pressure of the inflated balloon might have been transferred to the adjacent arterial wall, and this resulted in separation of the entire cylindrical-shaped atheroma from the arterial wall. Artery dissection after balloon angioplasty frequently happens adjacent to hard plaque, including calcification, and this previous report supports our hypothesis.

Although PTA is usually believed to be safe in TASC type A lesions, carefully evaluating the plaque characteristics is required to predict complications that can occur following intervention. In cases where diffuse, heavy calcification is suspected, the possibility of massive dissection should be kept in mind and proper management should be prepared.

REFERENCES


